WHAT IS CLAIMED IS:

1. An electrical feedthru apparatus comprising:

an electrically conductive transmission line;

a coating of dielectric material disposed over the electrically conductive transmission line; and

a housing attached about at least a portion of the electrically conductive transmission line.

2. The electrical feedthru apparatus of claim 1, wherein the coating is a micro-coating.

3. The electrical feedthru apparatus of claim 2, wherein the electrically conductive transmission line is electro-polished.

4. The electrical feedthru apparatus of claim 2, wherein the micro-coating is approximately 100 μm thick or less.

5. The electrical feedthru apparatus of claim 2, wherein the micro-coating is approximately 10 μm thick or less.

6. The electrical feedthru apparatus of claim 2, wherein the micro-coating is approximately 5 μm thick or less.

7. The electrical feedthru apparatus of claim 1, wherein the coating comprises a diamond-like carbon coating (DLC).

8. The electrical feedthru apparatus of claim 7, wherein the DLC comprises silicon for enhancing adhesion to the electrically conductive transmission line.

9. The electrical feedthru apparatus of claim 1, further comprising two or more layers of the coating.

10. The electrical feedthru apparatus of claim 9, wherein each of the two or more layers is approximately 2-5 μm thick.

11. The electrical feedthru apparatus of claim 9, wherein a first of the two or more layers is approximately 1 μm thick or less.

12. The electrical feedthru apparatus of claim 1, wherein the coating comprises a thermal conductor.

13. The electrical feedthru apparatus of claim 1, wherein the coating comprises a diamond-like thin film.

14. The electrical feedthru apparatus of claim 2, wherein the micro-coating has a breakdown voltage on the order of 100V per μm thickness.

15. The electrical feedthru apparatus of claim 1, further comprising a secondary coating disposed over the coating of dielectric material.

16. The electrical feedthru apparatus of claim 15, wherein the secondary coating comprises a dielectric adhesive attaching the electrically conductive transmission line to the housing.

17. The electrical feedthru apparatus of claim 16, wherein the dielectric adhesive comprises Araldite GY 6010 or Amine Hardener Hy 5200.

18. The electrical feedthru apparatus of claim 15, wherein the secondary coating comprises a metal layer brazed between the dielectric coating and the housing.

19. The electrical feedthru apparatus of claim 1, wherein the electrically conductive transmission line and the housing are attached by a compression or interference fit between mating tapered surfaces.

20. The electrical feedthru apparatus of claim 1, further comprising a plurality of electrically conductive transmission lines each coated with a dielectric coating spaced from one another and attached within the housing.

21. The electrical feedthru apparatus of claim 20, wherein a density of the electrical conductive transmission lines within the housing is greater than 0.32 transmission lines per mm^2.

22. The electrical feedthru apparatus of claim 21, wherein the density of the electrical conductive transmission lines within the housing is at least 0.4 transmission lines per mm^2.

23. The electrical feedthru apparatus of claim 22, wherein a density of the electrical conductive transmission lines within the housing is at least 0.8 transmission lines per mm^2.

24. The electrical feedthru apparatus of claim 1, wherein the coating comprises a diamond thin film applied by microwave plasma chemical vapor deposition (MPCVD).

25. The electrical feedthru apparatus of claim 1, wherein the coating comprises controlled atmosphere plasma sprayed (CAPS) ceramics.

26. An electrical feedthru apparatus comprising:

an outer body;

a conductive pin disposed in the outer body;

an electrically insulating micro-coating between the conductive pin and the outer body.

27. The electrical feedthru apparatus of claim 26, wherein the insulating coating is less than 100 μm thick.

28. The electrical feedthru apparatus of claim 27, wherein the insulating coating is less than 5 μm thick.

29. The electrical feedthru apparatus of claim 28, wherein the insulating coating is less than 2 μm thick.

30. An electrical feedthru apparatus comprising:

a body;

a plurality of conductive pins extending through the body;

wherein the conductive pin density comprises at least 0.4 pins per mm^2.

31. The electrical feedthru apparatus of claim 30, wherein the conductive pin density comprises at least 0.8 pins per mm^2.

32. The electrical feedthru apparatus of claim 30, wherein each of the plurality of conductive pins comprises a diamond-like carbon coating electrically insulating each of the conductive pins from the body.

33. An electrical feedthru comprising:

a body;

a conductive pin; and

a highly dielectric thin film adhered to at least a portion of the conductive pin;

wherein the conductive pin extends through and is attached to the body.

34. The electrical feedthru of claim 33, wherein the thin film comprises a diamond-like carbon coating or a diamond thin film.

35. The electrical feedthru of claim 33, wherein the thin film comprises multiple layers.

36. The electrical feedthru of claim 35, wherein a first of the multiple layers is less than 1 μm thick, and subsequent layers range between 1 and 10 μm thick.

37. An electrical feedthru comprising

a conducting pin;

a diamond-like carbon coating adhered to the conducting pin;

a body attached around the diamond-like carbon coating.

38. The electrical feedthru of claim 37, further comprising a plurality of conducting pins each coated with a diamond-like carbon coating disposed in the body.

39. The electrical feedthru of claim 37, wherein the diamond-like carbon coating comprises a first layer of 0.2 to 10 μm thick.

40. A multi-pin feedthru comprising:

a plurality of conductive pins extending through a single body, each of the plurality of conductive pins being spaced from one another; and

at least one thin film layer of dielectric material disposed over each of the plurality of conducting pins providing electrical insulation between the pins and the body.

41. The multi-pin feedthru of claim 40, wherein each of the plurality of conductive pins is substantially parallel to the others.

42. The multi-pin feedthru of claim 40, wherein the plurality of conductive pins comprises at least six pins arranged within no more than a 4 mm diameter.

43. The multi-pin feedthru of claim 40, wherein the thin film layer is a diamond-like carbon coating.

44. The multi-pin feedthru of claim 40, wherein the at least one thin film layer is between 0.2 and 10 μm thick.

45. An electrical feedthru comprising:

an electrically conductive pin;

an electrically insulative, thermally conductive coating adhered to the electrically conductive pin;

wherein the electrically conductive pin is hermetically sealed to a body through which the electrically conductive pin traverses.

46. The electrical feedthru of claim 45, wherein the electrically insulative, thermally conductive coating comprises carbon.

47. The electrical feedthru of claim 46, wherein the electrically insulative, thermally conductive coating comprises a diamond-like carbon coating.

48. The electrical feedthru of claim 45, wherein the electrically insulative, thermally conductive coating comprises one or more layers ranging between 0.2 and 10 μm in thickness.

49. An electrical feedthru comprising:
one or more electrical pathways;
an outer body through which the one or more electrical pathways penetrate;
an electrical isolator between the one or more electrical pathways and the outer body;
wherein the electrical isolator comprises a layer of no more than 100 μm.

50. The electrical feedthru of claim 49, wherein the electrical isolator comprises a diamond-like carbon coating or diamond thin film adhered to the one or more electrical pathways.

51. The electrical feedthru of claim 49, wherein the electrical isolator comprises controlled atmosphere plasma sprayed (CAPS) ceramics.

52. The electrical feedthru of claim 49, wherein the electrical isolator comprises a layer of no more than 10 μm.

53. The electrical feedthru of claim 49, wherein the outer body separates two distinct environments.

54. The electrical feedthru of claim 49, wherein the electrical isolator comprises a plurality of layers ranging between approximately 0.2 μm and 10 μm in thickness.

55. The electrical feedthru of claim 54, wherein each of the plurality of layers comprises a breakdown voltage of at least approximately 50 volts per μm of layer thickness.

56. The electrical feedthru of claim 55, wherein each of the plurality of layers comprises a breakdown voltage of at least approximately 100 volts per micro-meter of layer thickness.

57. An apparatus comprising:

a micro-electro-mechanical-system (MEMS) package;

an electrical feedthru electrically attached to the MEMS package and disposed between two distinct environments, the electrical feedthru comprising:

a housing;

an electrical pathway passing through the housing; and

an electrical isolator less than about 500 μm thick disposed between the housing and the electrical pathway.

58. The apparatus of claim 57, wherein the electrical isolator is less than 100 μm thick.

59. The apparatus of claim 57, wherein the electrical isolator is a diamond-like carbon coating.

60. The apparatus of claim 59, wherein the electrical isolator comprises one or more layers ranging between approximately 0.2 and 10 μm in thickness.

61. A method of making an electrical feedthru comprising coating a conductive pin with a layer of highly dielectric material and attaching the conductive pin to a housing.

62. The method of claim 61, wherein the coating is about 10 μm thick or less.

63. The method of claim 61, further comprising coating the conductive pin with multiple layers of highly dielectric material.

64. The method of claim 61, wherein the highly dielectric material comprises a diamond-like carbon coating.

65. The method of claim 61, further comprising applying a dielectric adhesive to the housing, the conductive pin, or both the housing and the conductive pin to attach the conductive pin to the housing.

66. The method of claim 61, wherein the attaching comprises:

metalizing an outer surface of the conductive pin over the layer of highly dielectric material; and

brazing the conductive pin to the housing.

67. The method of claim 61, wherein the attaching comprises:

heating the housing to a temperature above ambient;

inserting the conductive pin in a corresponding hole in the housing; and

cooling the body to compress the conductive pin within the housing.

68. The method of claim 67, wherein the attaching further comprises providing mating tapered surfaces to the conductive pin and the housing.

69. A method of controlling capacitance of an electrical feedthru comprising coating a conductive pin with one or more micro-layers of dielectric material.

70. The method of claim 69, further comprising varying the thickness of the one or more micro-layers of dielectric material.

71. The method of claim 69, wherein the one or more micro-layers comprises a diamond-like carbon coating or a diamond thin film.

72. The method of claim 69, further comprising adding a layer of adhesive over the one or more micro-layers of dielectric material.

73. A method of electrically interfacing between two distinct environments comprising:

inserting an electrical feedthru between the two distinct environments;

wherein the electrical feedthru comprises one or more electrical transmission lines coated with a highly dielectric thin film.

74. The method of claim 73, wherein the highly dielectric thin film comprises one or more layers of diamond-like carbon coating.

75. A method of making an electrical feedthru comprising coating an inner surface of a hole through a housing with a layer of highly dielectric material and attaching a conductive pin within the hole.